What is Safety Culture
&
Why is it Important?

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The IAEA advisory group INSAG

*"A vital conclusion drawn from this behaviour is the importance of placing complete authority and responsibility for the safety of the plant on a senior member of the operations staff of the plant. Of equal importance, formal procedures must be properly reviewed and approved must be supplemented by the creation and maintenance of a '**nuclear safety culture**'".*

(INSAG-1, 1986)

The concept of the safety culture was formally introduced in the area of nuclear safety.

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Definition of safety culture

"Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receives the attention warranted by their significance".

(INSAG-4, 1991)

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Theories of organizational culture

- From 1980 until today

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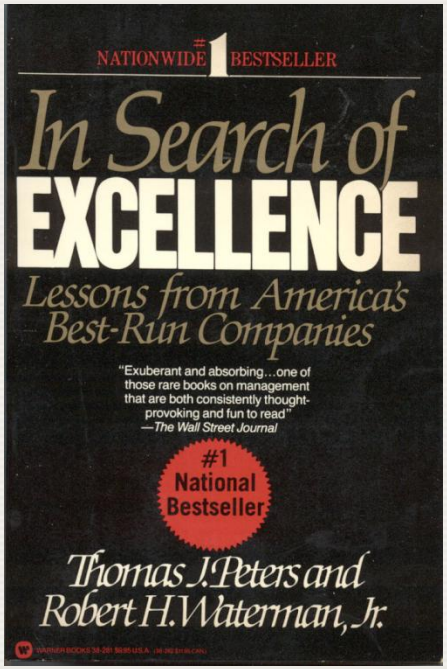
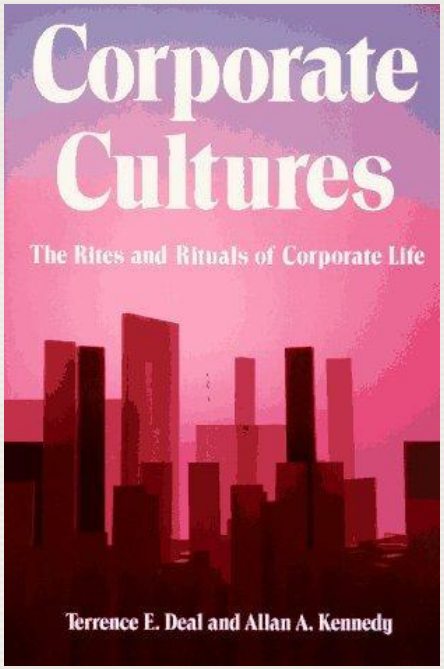
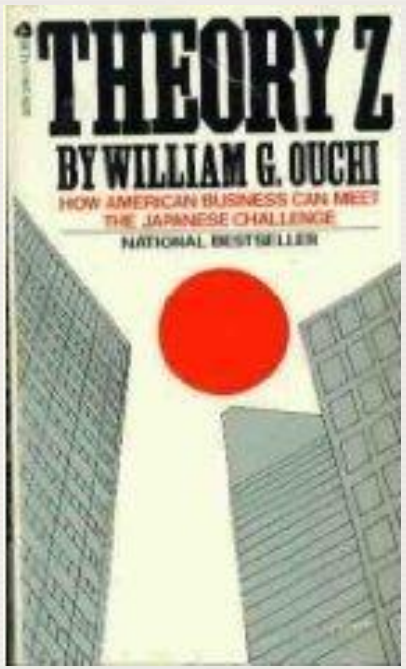
The 1980's organizational culture theories

- The oil crisis and Japan: an attempt to explain Japan's economic success
- From low quality to high quality
- A wave of management literature in the early 80's, e.g. *Corporate Cultures*, *In Search of Excellence, Theory Z*

The 1980's organizational culture theories







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The 1980's organizational culture theories

- Companies did of course have cultures before this...
- ...but now culture was considered a source of success
- Culture was used to explain why some companies were more successful than others
- The importance of a strong and homogeneous culture was emphasised
- Management's role was considered extremely important
- Culture was something to manage and control...

...in order to reach 'excellence'...

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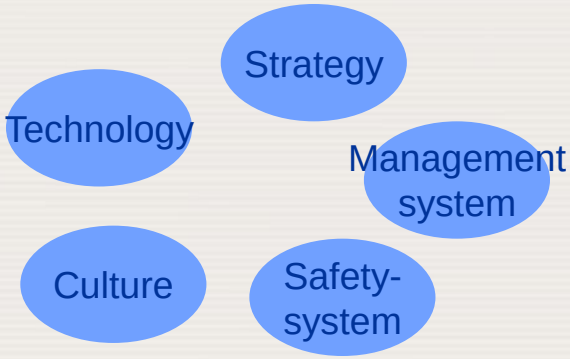
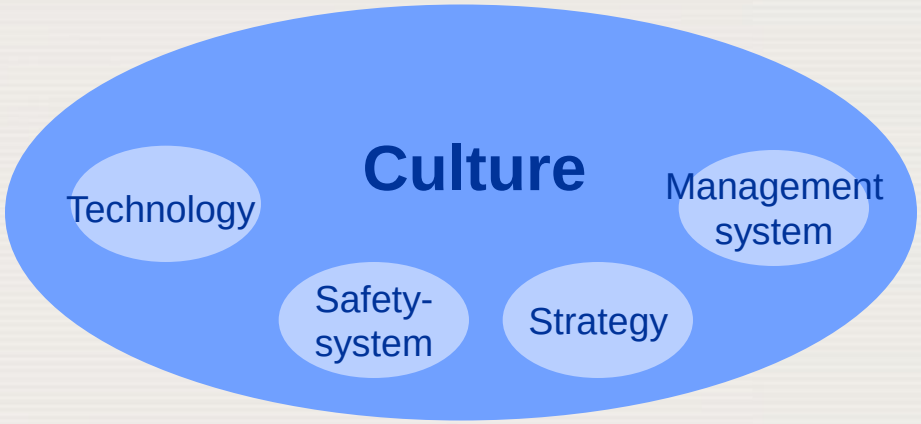
From Variable to Metaphor Approach





Culture as one variable amongst others:

Culture as something inherent in all aspects of the organisation:

The Variable Approach

Organizations have cultures

The Metaphor Approach

Organizations are cultures

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Organizational culture theories nowadays

- Culture is seen as less of a ‘quick fix’
- It is recognized that culture can be changed, but it is also recognized that this often takes
  - time,
  - effort, and
  - does not always end up the way it is planned.
- Culture can be seen as something we can influence, rather than something we can control
- Culture work needs to encompass the whole organization – not a top-down process
- Communication is essential
- Shared understanding

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The progress of the safety culture concept

- Twenty five years of work

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What progress have been made since 1986?

- Not much…

  … but some achievement have been accomplished
- Internationally recognized concept in high reliability organisations
- International safety standards acknowledge the importance
- Safety culture assessments are common practice

The general safety culture approach is still not up to date with the theory of organizational culture

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The safety culture concept

- Is it still valid and important?

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The National Diet of Japan

"What must be admitted – very painfully – is that this was a disaster "Made in Japan."

Its fundamental causes are to be found in the ingrained conventions of Japanese culture:

- our reflexive obedience;
- our reluctance to question authority;
- our devotion to 'sticking with the program';
- our groupism;
- and our insularity.

Had other Japanese been in the shoes of those who bear responsibility for this accident, the result may well have been the same."

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INPO 11-005 Addendum August 2012

Lessons Learned from the Nuclear Accident at the Fukushima Daiichi Nuclear Power Station

"Behaviors prior to and during the Fukushima Daiichi event revealed the need to strengthen several aspects of nuclear safety culture. It would be beneficial for all nuclear operating organizations to examine their own practices and behaviors in light of this event and use case studies or other approaches to heighten awareness of safety culture principles and attributes."

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2nd Extraordinary Meeting of the Contracting Parties to the Convention of Nuclear Safety

27-31 August 2012, Vienna, Austria

Issues to be considered:

Safety culture and human and organizational factors were identified as crosscutting issues, which affect the consideration of external events, design, severe accident management, including operator training, the good functioning of national organizations and emergency preparedness and response. Particular attention should be given to these in preparation of National Reports for the next Review Meeting.

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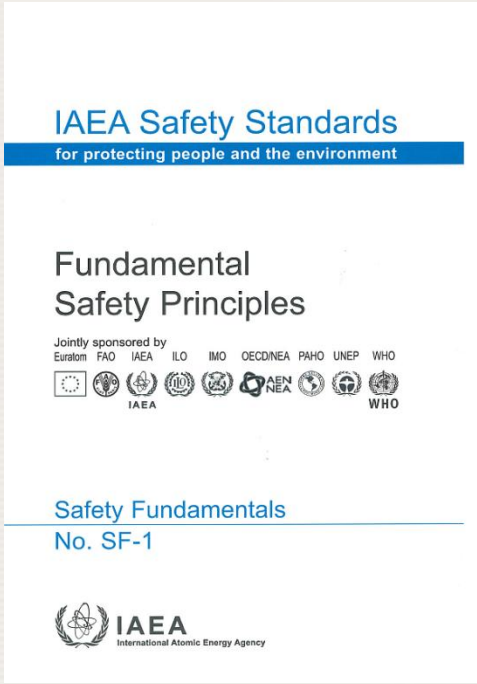
Safety standards hierarchy



Global reference for a high level of nuclear safety

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Safety Principle SF-1

Integrated management systems

Principle 3: Leadership and management for safety

3.12. *"…Safety has to be achieved and maintained by means of an effective management system. This system has to* ***integrate all elements*** *of management so that requirements for safety are established and applied coherently with other requirements, including those for human performance, quality and security, an that* ***safety is not compromised by other requirement or demands****. The management system also* ***has to ensure the promotion of a strong safety culture****…"*

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Safety Principle SF-1

Integration of safety culture

3.13. *"A safety culture that governs the attitudes and behaviour in relation to safety of all organizations and individuals concerned must be integrated in the management system. Safety culture includes:*

- *Individual and collective **commitment** to safety on the part of the leadership, the management and personnel at all levels;*
- ***Accountability** of organizations and of individuals at all levels for safety;*
- *Measures to encourage a **questioning and learning attitude** and to discourage complacency with regards to safety."*

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Safety Principle SF-1

The Interaction between individuals, technology and the organization - ITO

3.14. *"An important factor in a management system is the recognition of the entire range of **interactions** of **individuals** at all levels with **technology** and with **organizations**. To prevent human and organizational failures, human factors have to be taken into account and good performance and good practices have to be supported."*

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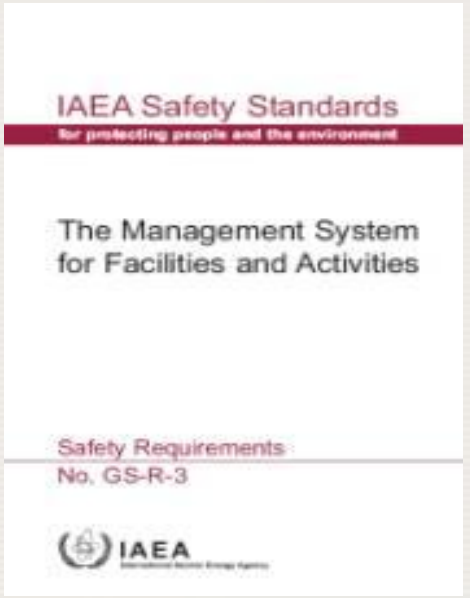
Safety standards hierarchy



Global reference for a high level of nuclear safety

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Safety (Culture) Requirement GS-R-3

*"The management system shall be used to **promote and support a strong safety culture** by:*

- *Ensuring a **common understanding** of the key aspects of safety culture within the organization;*
- ***Providing the means** by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between **individuals, technology and the organization**;*
- *Reinforcing a **learning and questioning attitude** at all levels of the organization;*
- *Providing the means by which the organization continually seeks to **develop and improve** its safety culture."*

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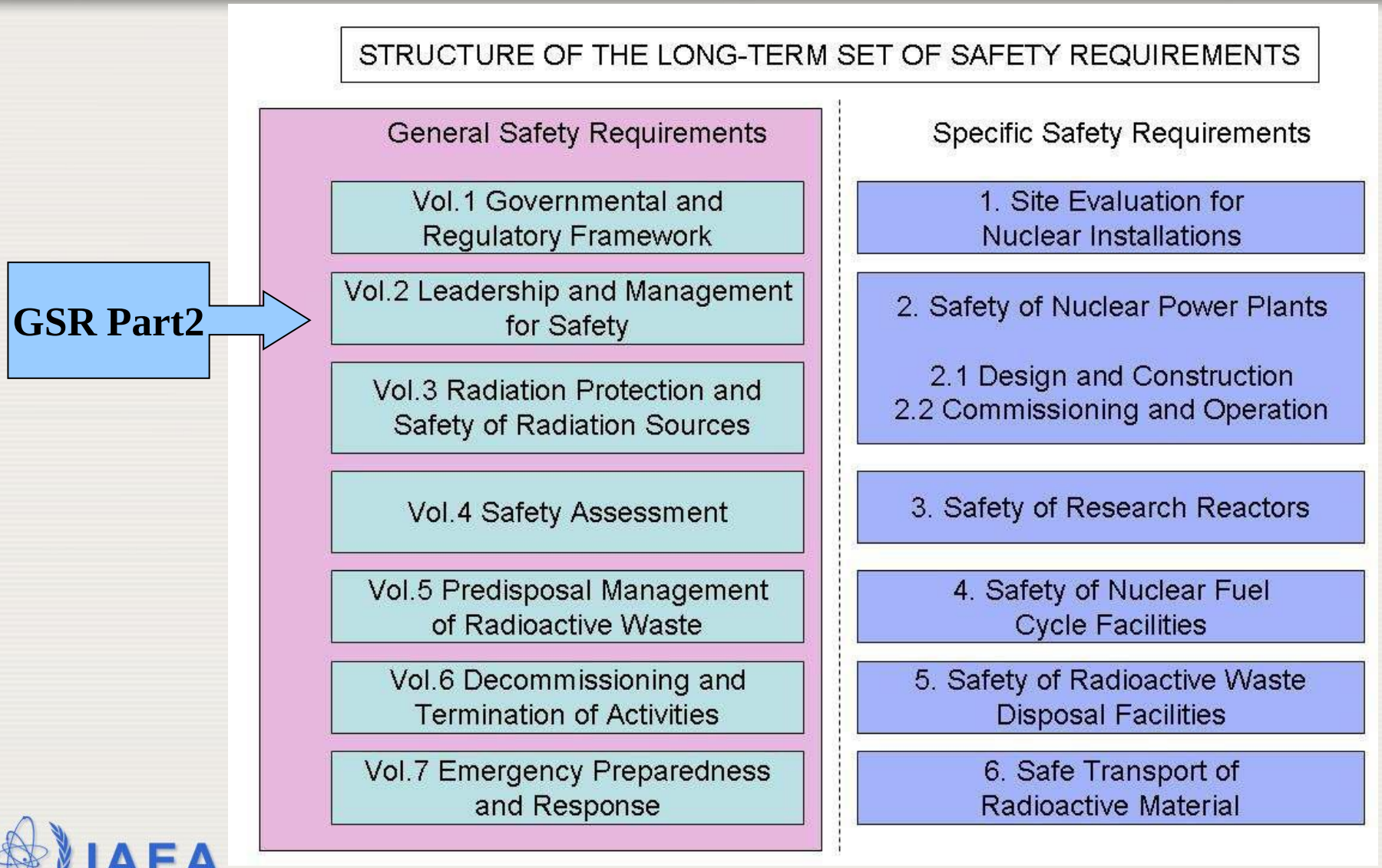
Revision of GS-R-3



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Objective of the GS-R Part II

Leadership and Management for Safety

- The application of SF-1 to establish requirements for:
  - ✓Effective leadership for safety
  - ✓Effective management for safety
  - ✓Effective safety culture improvement activities
- Safety as a sustainable outcome of excellence in leadership and management
- Integrated management system: make sure that other requirements will not compromise Nuclear Safety
- Systemic approach of ITO

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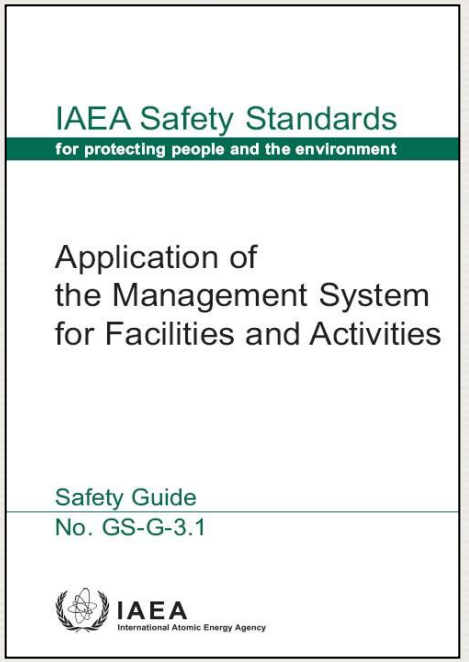
Safety standards hierarchy



Global reference for a high level of nuclear safety

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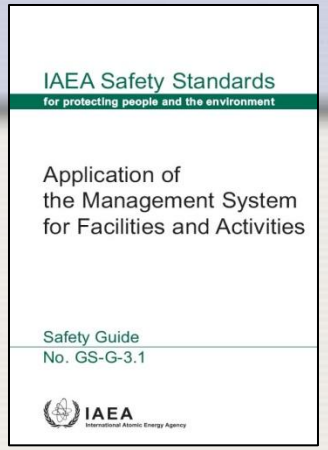
IAEA Safety culture characteristics and attributes (GS-G-3.1)



Safety Culture Characteristics

- Safety is a clearly recognized value
- Leadership for safety is clear
- Accountability for safety is clear
- Safety is integrated into all activities
- Safety is learning driven

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Safety is a clearly recognized value
Attributes

- High priority to safety: shown in documentation, communications and decision- making
- Safety is a primary consideration in the allocation of resources
- The strategic business importance of safety is reflected in business plan
- Individuals are convinced that safety and production go ‘hand in hand’
- A proactive and long-term approach to safety issues is shown in decision-making
- Safety conscious behavior is socially accepted and supported (both formally and informally)

Accountability for safety is clear
Attributes

- Appropriate relationship with the regulatory body exists, which ensures that the accountability for safety remains with the licensee
- Roles and responsibilities are clearly defined and understood
- There is a high level of compliance with regulations and procedures
- Management delegates responsibilities with appropriate authority to enable accountabilities
- Ownership for safety is evident at all organizational levels and by all individuals

Safety is learning driven
Attributes

- A questioning attitude prevails at all organizational levels
- An open reporting of deviations and errors is encouraged
- Internal and external assessments, including self-assessments are used
- Organizational and operating experience (both internal and external to the facility) is used
- Learning is enabled through the ability to recognize and diagnose deviations, formulate and implement solutions and monitor the effects of corrective actions
- Safety performance indicators are tracked, trended, evaluated and acted upon
- There is a systematic development of staff competencies

Safety is integrated into all activities

Attributes

- Trust permeates the organization
- Consideration for all types of safety, including industrial and environmental safety and security, is evident
- Quality of documentation and procedures is good
- Quality of processes, from planning to implementation and review, is good
- Individuals have the necessary knowledge and understanding of the work processes
- Factors affecting work motivation and job satisfaction are considered
- Good working conditions exist with regards to time pressures, work load and stress
- Cross-functional and interdisciplinary cooperation and teamwork are present
- Housekeeping and material condition reflect commitment to excellence

Leadership for safety is clear

Attributes

- Senior management is clearly committed to safety
- Commitment to safety is evident at all management levels
- Visible leadership showing involvement of management in safety related activities
- Leadership skills are systematically developed
- Management assures that there is sufficient and competent staff
- Management seeks the active involvement of staff in improving safety
- Safety implications are considered in the change management process
- Management shows a continuous effort to strive for openness and good communications throughout the organization
- Management has the ability to resolve conflicts as necessary
- Relationships between management and staff are built on trust

Safety (Culture) Guidance GS-G-3.5

Specific guidance for nuclear installations*

- **Further explanation of the five safety culture characteristics and the attributes**
- **Improving safety culture**
- **Warning signs of a decline in safety culture**
- **Concept of interaction between individuals, technology and the organisation**
- **Assessment of safety culture**

* Nuclear power plants, other reactors (research and critical assemblies), nuclear fuel cycle facilities

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IAEA Safety culture publications

Document	Title
Safety Fundamentals No. SF-1	Fundamental Safety Principles
Safety Requirements No. GS-R-3	The Management System for Facilities and Activities
Safety Guide No. GS-G-3.1	Application of the Management System for Facilities and Activities
Safety Guide No. GS-G-3.5	The Management System for Nuclear Installations
Safety Series No. 75-INSAG-4	Safety Culture
Safety Series No. 75-INSAG-15	Key Practical Issues in Strengthening Safety Culture
Safety Report Series No. 11	Developing Safety Culture in Nuclear Activities
Safety Report Series No. 42	Safety Culture in the Maintenance of Nuclear Power Plants
Safety Report Series:	Safety Culture during Pre-Operational Phases – approved draft
Safety Report Series:	How to Perform Safety Culture Self-Assessment - draft
Safety Report Series:	How to Continuously Improve Safety Culture - draft
TECDOC-1321	Self-assessment of safety culture in nuclear installations
TECDOC-1329	Safety culture in nuclear installations
TECDOC:	Regulatory Oversight Of Safety Culture In Nuclear Installations

Post-Fukushima activities – Strengthening of Nuclear Safety

IAEA Ministerial Conference on Nuclear Safety Vienna, 20-24 June 2011

Chairpersons' Summaries

15. In spite of all recent efforts there is still room for improvement in understanding the concept of safety culture and implementing it effectively worldwide in the management of all NPPs.

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What does it mean to work with Safety Culture?

- Continuously improving and assessing

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Making safety culture tangible

IAEA offer safety culture self-assessment training courses and senior management workshops

Purpose

- To develop competence in recognizing safety culture manifestation in daily work

Approach

- 3 day senior management workshop
- 2 x 5 days training with assigned reading in-between
- Interactive
- Team building (shared space)
- Learning-by-doing (intellectual, emotional and practical)
- Consist of presentations, lectures, dialogues, exercises

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Benefits of performing self-assessment

Train nuclear personnel to think ‘differently’ – orient towards behaviour science

Organizational Investment in:

- Knowledge – Enhanced understanding
- Skills – Learning by doing
- Competence – Safety cultural mindfulness as part of performing work, alert for weak signals

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Main objective of assessing safety culture

- Build a clear understanding of the organization's culture and safety culture
- Sensitize management and the organization to the need for action and transformational change
- Create motivation for transformation of practices and ways of thinking about oneself and the organization

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Working with safety culture

- Safety culture involves three aspects:
  - Management for safety – formal framework
  - Actions and practices – actual behaviours
  - Shared understanding – comprehension of safety

To be successful you need to work with all three aspects

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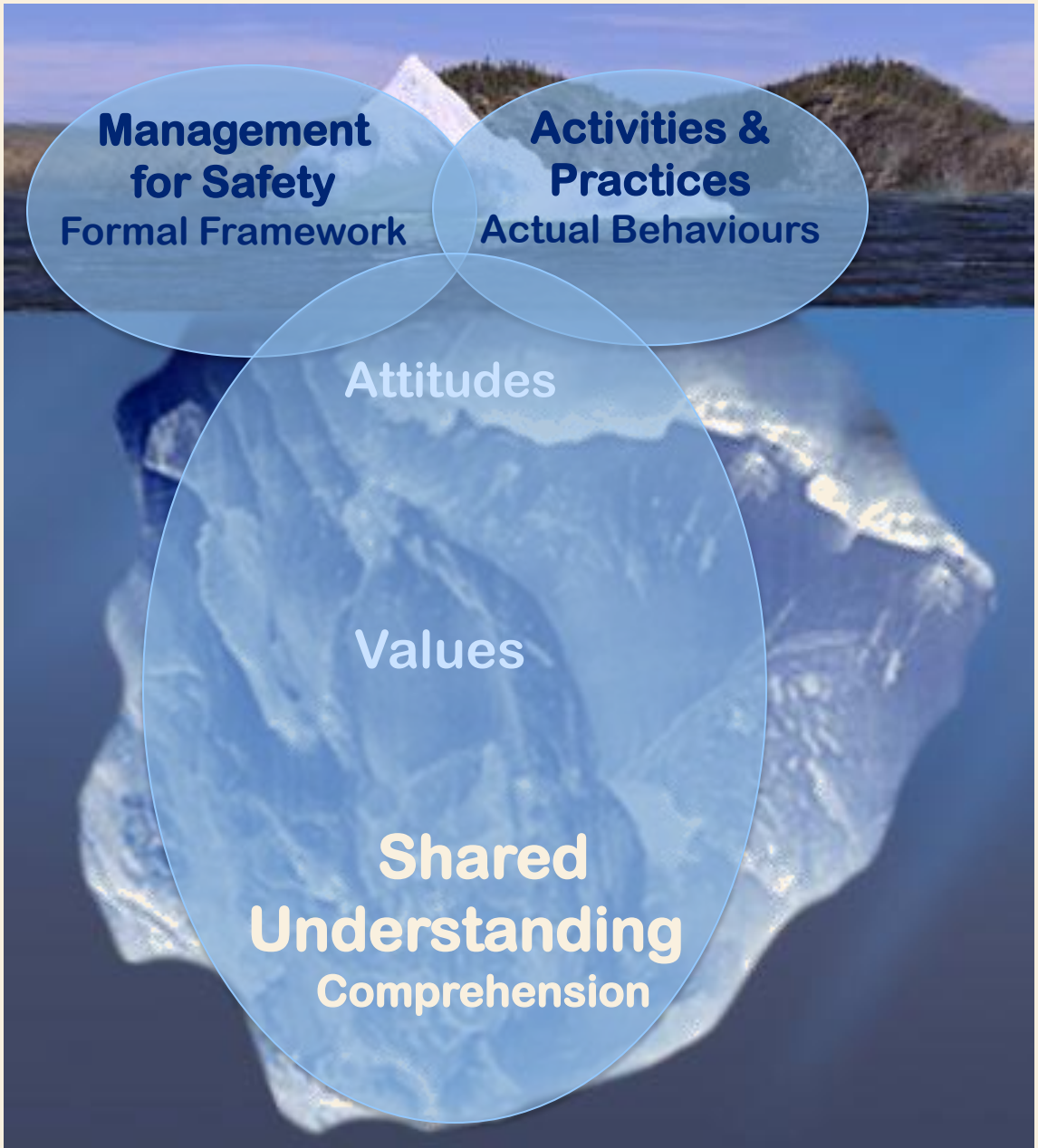
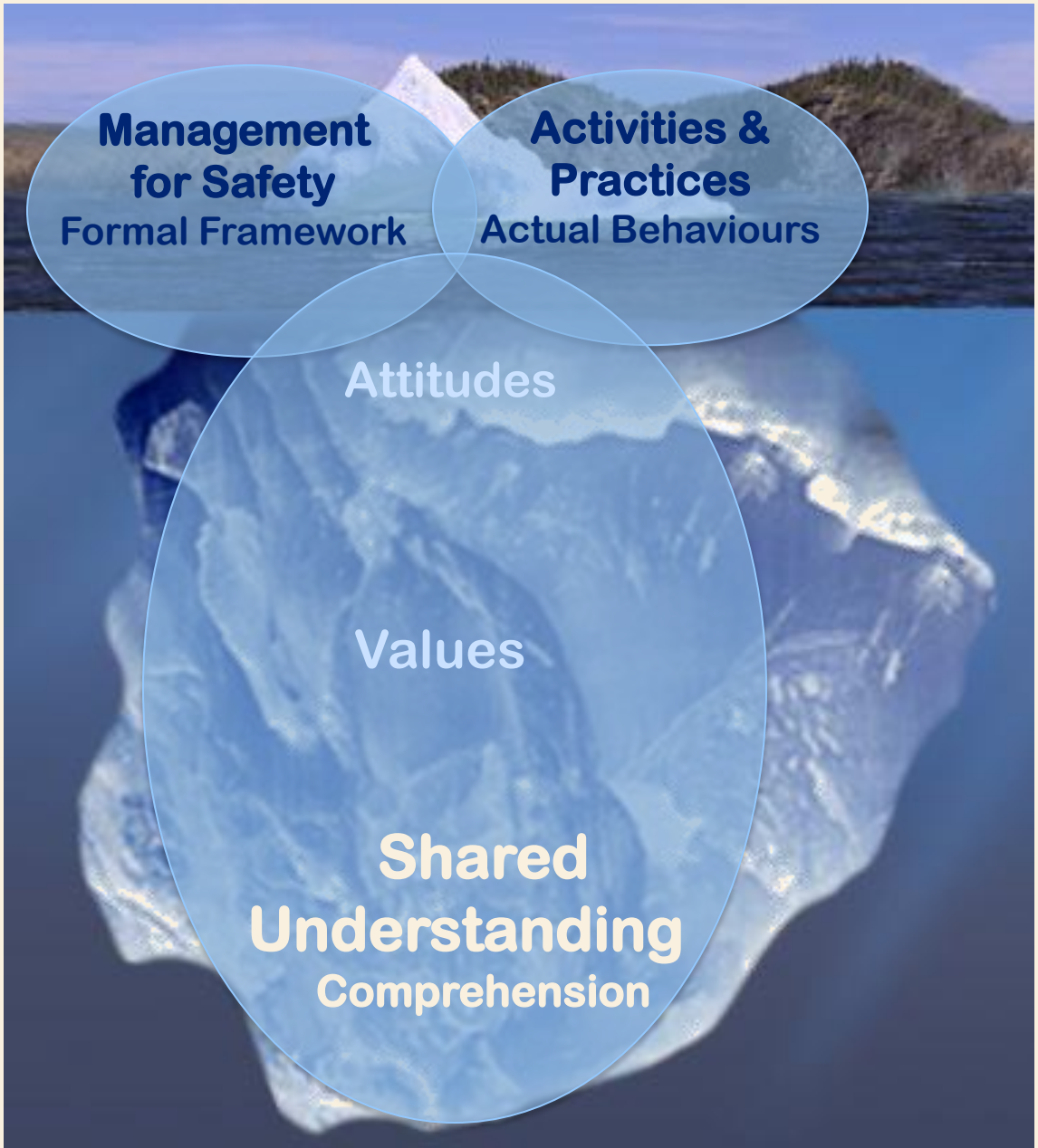
The three aspects of safety culture



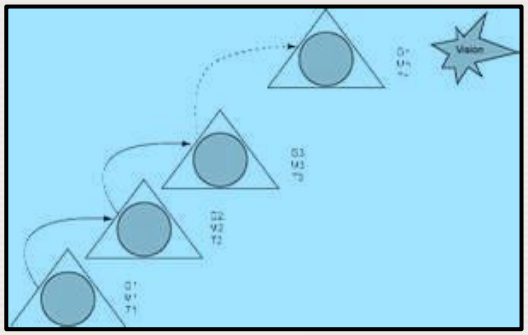
Continuous vs transformational

- Incremental improvement:
  - process, activity, or practice that benefits the organization but is not necessarily optimal in terms of effectiveness or efficiency
  - operates at the artifact level
- Transformative improvement:
  - changes the fundamental approach
  - operates at the level of understanding

The three aspects of safety culture



Nature of Culture Change



Incremental

Continual

Transformational

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Mindful Communication

- Culture change is about communication - to influence thinking – shifting what has **meaning** and create shared understanding
- Needs an approach that:
  - understands what, who and how to communicate
  - involves visible and facilitative leadership
  - encourages non-blaming, solution- and opportunity-focused language
  - uses dialogue and enables informal networking to foster understanding and learning

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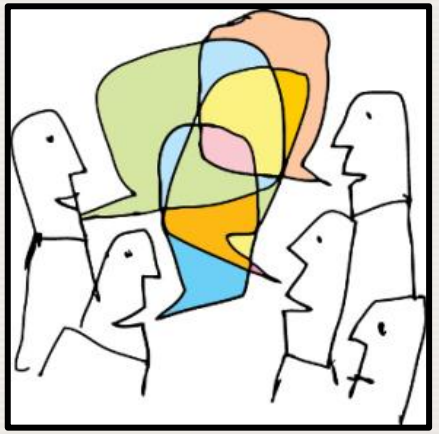
The difference….

Debate

Discussion



Dialogue

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Continuous improvements of safety culture

- The formation of shared understanding is a significant component of safety culture enhancement
- The quality of interaction influences the extent to which individuals are prepared to contribute, learn and focus on shared goals
- Power dynamics can undermine motivation
- Shared space that recognizes, respects, includes, supports organizational learning

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Shared
Space

Shared space characterized by

- Working relationships that support trust
- Decrease of power dynamics
- Mutual respect
- Openness – free flow in sharing of thoughts and ideas
- Enables individuals to express views related to their inner thoughts and feelings about a particular issue without fear of recrimination or exclusion
- Shared space goes deeper than sharing facts
- Dialogue instead of discussion/argumentation

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Ultimate goal of shared space

To tap into the wealth of knowledge, experience and insight in the organization, and to build shared understanding that supports safe behaviours.

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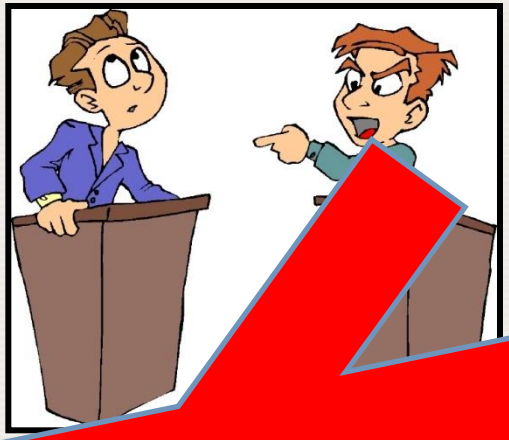
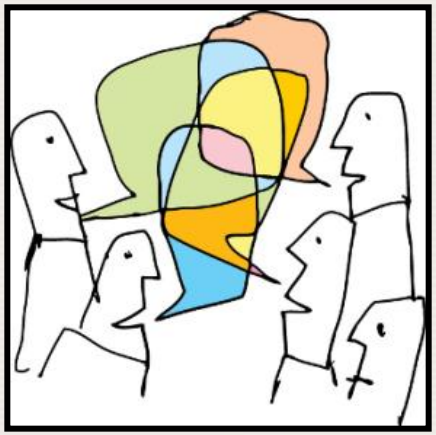
Difference in communication….





Safety performance

- Safety understanding and safety conscious actions and practices drive safety performance moment-to-moment
- Depends on the **ability** and **willingness** of individuals to continually think, engage, and collaborate
- Shared space is an important determinant of achieving shared understanding and collaboration

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Respect, recognition and inclusion

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IAEAs safety culture ambitions

- Provide useful and practical support, services and guidance to the Member States
- New practical safety culture publications
- Training and support on safety culture self-assessment
- Offer safety culture independent assessment within the OSART* framework
- Enhance the global safety culture

In general make safety culture more understandable and tangible

* Operational Safety Review Team – IAEAs safety review service to evaluate the nuclear utilities safety level compared with IAEA safety standards

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How to request a training course on Safety Culture Self-Assessment

Send the request to

the competent official authority

(Ministry of Foreign Affairs or National Atomic Energy Authority)

for transmission to the International Atomic Energy Agency, PO Box 100, Vienna International Centre, 1400 Vienna, Austria

Refer to Safety Culture Self-Assessment Course provided by NSNI/OSS

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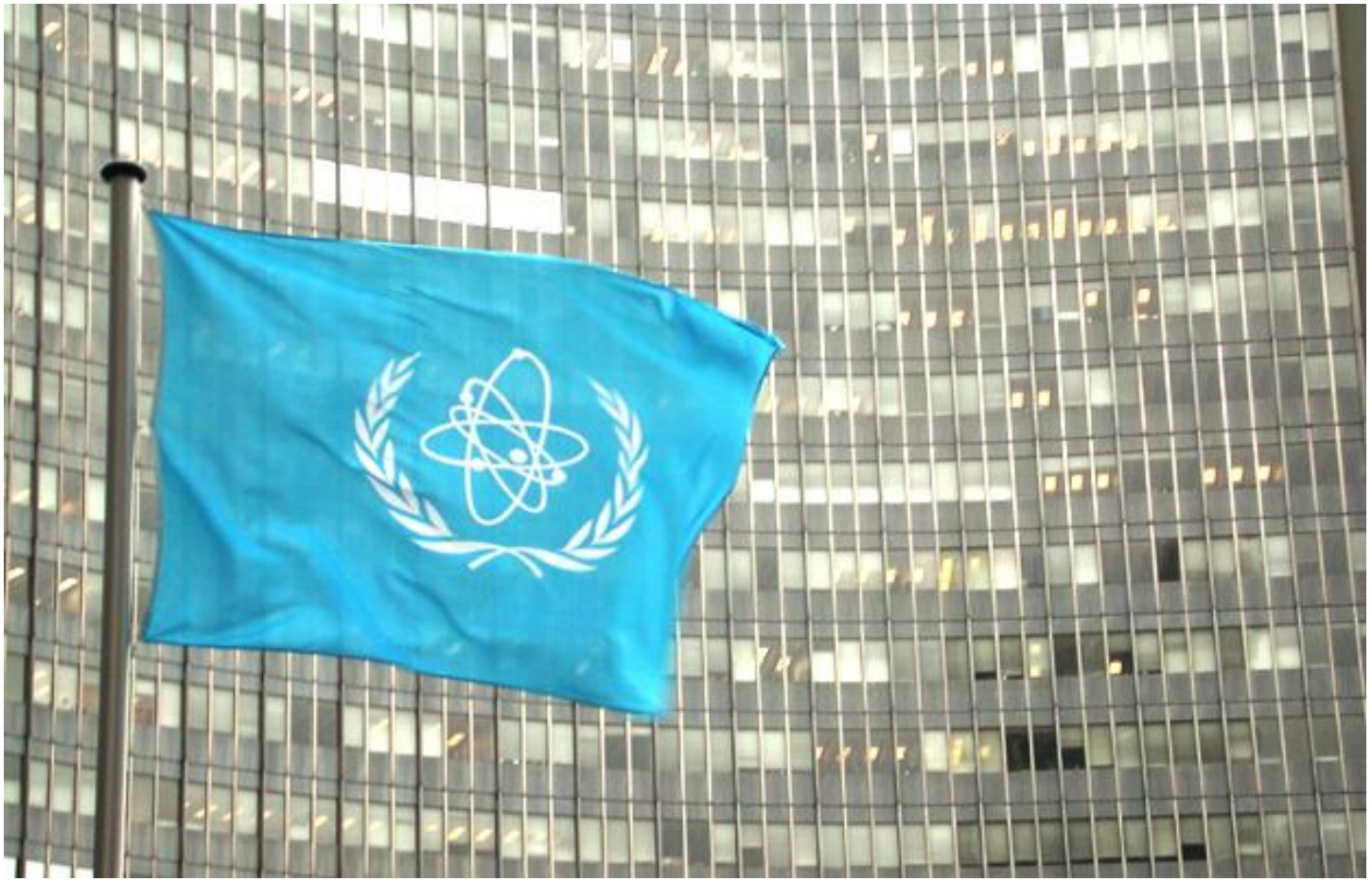
A well-designed organization is not a stable solution to achieve, but a developmental process to keep active.
(Starbuck & Nystrom, 1981, p. 14)



…Thank you for your attention